

CLAIMS

Sub B1
1. A method for detecting and/or quantifying one or more analyte(s) in solution, characterised by

a) binding of two or more proximity probes to a respective binding site on said analyte(s), wherein the proximity probes are comprised of a binding moiety and a thereto coupled nucleic acid;

b) allowing the binding moiety to bind to the analyte(s) and allowing the nucleic acids to interact with each other if they are in close proximity to each other; and

c) detection and/or quantification of the degree of interaction between the nucleic acids

with the proviso that the binding moieties and the analyte(s) not all comprise nucleic acid.

2. A method according to claim 1, further comprising amplification of the interacted nucleic acids and detection/quantification of the amplification product.

Sub B1
3. A method according to ^{claim 1} ~~claims 1 or 2~~, wherein the binding moieties of the proximity probes are selected from a protein, such as a monoclonal or polyclonal antibody, lectin, soluble cell surface receptor, combinatorially derived protein from phage display or ribosome display, peptide, carbohydrate, nucleic acid, such as an aptamer, or combinations thereof.

Sub D2
4. A method according to ^{claim 1} ~~claims 1, 2 or 3~~, wherein the analyte(s) is/are protein(s), protein aggregate(s), prion(s) and/or nucleic acid(s).

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5. A method according to ^{claim 1} ~~claims 1, 2, 3 or 4~~, wherein the binding sites for the binding moieties of the proximity probes are on one and the same analyte, or on two close analytes.

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6. A method according to ~~any of the above claims~~ ^{claim 1}, wherein the binding moieties are antibodies and said antibodies each bind to the analyte(s) via a further antibody having binding specificity for the analyte(s), and wherein the binding moieties are directed against the Fc portion of the further antibody.

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7. A method according to ~~any of the above claims~~ ^{claim 1}, wherein the interaction of said nucleic acids coupled to the binding moieties is through hybridisation to a common splint template and ligation of the nucleic acid ends.

8. A kit for detecting and quantifying one or more analyte(s) in solution, comprising

- a pair of proximity probes comprising binding moieties with affinity for the analyte(s) and each provided with a nucleic acid (reactive functionality) capable of interacting with each other; and optionally
- a ligase and a splint template for joining the nucleic acids,
- primers which hybridise to each of the nucleic acids.

9. A kit according to claim 8, comprising

- a first pair of binding moieties being a first pair of antibodies with affinity for the analyte; and
- a second pair of binding moieties being a second pair of antibodies directed against the Fc portion of the first pair of antibodies.

10. A kit according to claim 8, comprising three proximity probes one with a 3' free nucleic acid (A), one with a 5' free nucleic acid (B), and one with both 3' and 5' free nucleic acids (C), wherein the 3' end of A interacts with the 5' end of C and the 3' end of C interacts with the 5' end of B.

11. A kit according to claim 8, wherein the binding moieties are aptamers and further comprising a bivalent affinity reagent for dimerising two analytes each with only one aptamer binding site.

12. A kit according to claim 8, comprising several pairs of proximity probes each with a specific binding moiety and unique nucleic acids for identification.

Sub A2 13. Use of the method according to any one of claims 1-7 and/or the kit according to any one of the claims 8-12 for screening for ligand-receptor interaction antagonists a high throughput screening procedure.

14. Use of the method according to any one of claims 1-7 and/or the kit according to any one of the claims 8-12 for competitive detection and/or quantification of an unknown analyte in solution.

15. Use of the method according to any one of claims 1-7 and/or the kit according to any one of the claims 8-12 for screening ligand candidates in a large pool.

16. Use of the method according to any one of claims 1-7 and/or the kit according to any one of the claims 8-12 for screening of drug candidates from large libraries.

17. Use of the method according to any one of claims 1-7 and/or the kit according to any one of the claims 8-12 for detection of infectious agents.

18. Use according to claim 17, wherein the infectious agent is detected in food for humans and animals.

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